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TEMPUS JOINT EUROPEAN PROJECT 1179-90/1

Final Report
for Year 1990-1991.

by

R.Fletcher, L.Smrcek, F.N.Coton

Departmental Report No. 9223 May 1992

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TEMPUS

JOINT EUROPEAN PROJECT 1179-90/91

"Enhancement of Teaching Methods in Aeronautical Engineering Within Czechoslovakia"

Final Progress Report. for year 1990-91

by

R.Fletcher, Dipl.Ing L. Smrcek & Dr.F.Coton,
Dept. of Aerospace Engineering
University of Glasgow

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1. Action 1 Activities.

1.1 Role of Participating Institutions.

The JEP is coordinated and administered from the Department of Aerospace Engineering, University of Glasgow, UK on behalf of the 12 participating Institutions. The day- to-day running of the project is supervised by an administrator based in Glasgow. The administrator deals with all aspects of the JEP such as accounting procedures, order processing, travel arrangements from Glasgow, accommodation for Czech academics and students on assignments in Glasgow and assistance with liaison between the other participating Institutions. The administrator reports directly to the project coordinators in Glasgow and Czechoslovakia. The project coordinators are responsible for decision making in fulfilling the aims of the JEP and are thus in regular contact with each other and with Heads of Department, Section Leaders and similarly placed persons in the participating Institutions.

None of the other EC Institutions have an administrator, and indeed do not need one. But a substantial burden of administrative duties has fallen on the Department of Aeronautical Engineering in the Technical University of Prague as the Institution particularly deriving benefit from the JEP, and a case can be made for appointing a counterpart to the Glasgow administrator, also on a part time basis, working from the Technical University of Prague.

The overall scope of the project is monitored by a Tempus steering board which meets annually to review progress and decide policy.

All the participating Institutions are active in providing training for visiting Czech teachers and students and for making their facilities available generally to fulfil the objectives of the JEP. Their only administrative responsibility is to make the necessary arrangements for accommodating visiting students and staff.

1.2 Benefits for Eligible Countries.

1.2.1 General

The primary objectives of the project awarded under the TEMPUS scheme, for which Glasgow is the

coordinating institution, are the enhancement of teaching methods in aeronautical engineering in Czechoslovakia and the establishment of mutually beneficial links between Czech Universities and industry. In addition, collaboration between these organisations and the participating European institutions is being encouraged.

The European educational institutions involved in the project have, so far, provided placements for Czechoslovakian students and staff on retraining exercises. It is hoped to extend the involvement of these institutions in the second year to include participation in the detailed aircraft design projects. These institutions will also contribute to the teaching of a new course at CVUT consisting of specialist lectures in aerospace engineering. The Czechoslovakian enterprises have been in close contact with CVUT and have participated actively in the student design projects. They have also provided placements for British students from Glasgow University.

In the course of the project, staff members from the Technical University of Prague have participated in training programmes hosted by European academic institutions in key aircraft design disciplines including, aerodynamics, structures and systems. The new methods and technologies made available to these staff members will allow CVUT to undergo significant curriculum development in the near future. It is hoped that, on completion of the TEMPUS project new course curricula will have been established in Czechoslovakia and strong links between all the institutions participating in the project will have been forged. In the next two years Czechoslovakian staff will also receive training in the commercial aspects of the aircraft industry, such as Management, Financing and Marketing.

The benefits to Czechoslovakia from this project are already becoming apparent. In addition to the substantial quantity of high quality equipment already purchased for CVUT, staff from the institution have been exposed to modern technology in all aspects of the academic environment from teaching to administration. The scheme is spreading to encompass more and more of the aeronautical education disciplines of current relevance. It is hoped that, with the addition of a new Czechoslovakian educational establishment in the second year, the project can address more of the current shortfalls of the Czechoslovakian system and produce a more consistent approach to aeronautical education within the country.

One of the most significant features of the past year has been the interaction of the TEMPUS programme with our ongoing ERASMUS scheme. Most of the European partners in the ERASMUS scheme are also members of the TEMPUS consortium. This has allowed TEMPUS business to be discussed at ERASMUS meetings and vice-versa, thus increasing the flow of communication without increasing the cost. This has been of significant benefit to both schemes.

1.2.2 Equipment

May/June 1991 Details of possible computer equipment for CVUT were discussed by Dr. F. Coton , (Coordinator, Glasgow) and Prof. V. Broz during the latter's visit to the Department.

August 1991 Configuration of CVUT computer suite was agreed between Glasgow and CVUT and orders were placed for Hewlett-Packard equipment.

September 1991 Further Hewlett-Packard and peripheral computing equipment orders finalised. One small low speed wind tunnel ordered from Pliny and partners educational suppliers for teaching laboratory use. One lecture/demonstration smoke tunnel ordered from the same source. In addition, equipment for student project work on experimental aerodynamics and propulsion units, were purchased in conjunction with teaching laboratory equipment.

Additional Comments: Hewlett-Packard equipment was ordered in preference to the proposed I.B.M. configuration after consideration of the tenders offered by the two companies. The capability of the resulting computer suite is greater than that originally proposed and is, thus, more beneficial to CVUT.

1.2.3 Course Enhancement at CVUT

Czechoslovakian staff visiting European educational establishments have studied the curricula of those institutions. The information gathered will be used to assess and update the CVUT curriculum. A report on the proposed changes is currently in preparation. In addition, the TEMPUS JEP has allowed CVUT to develop and establish a post-graduate course based on lectures given by visiting European staff, and involving study visits abroad.

1.2.4 Information and Publicity.

Staff/student assignments and interchanges were publicised in the June edition of the University Newsletter (Appendix 3)

Four Glasgow students due to visit Czechoslovakia, together with Professor Broz, Ing. Vitek, Ing. L. Smrcek and Mr. R. Fletcher, were interviewed by the B.B.C. during a visit to British Aerospace at Prestwick Airport. These edited interviews were subsequently broadcast on B.B.C. Radio Scotland. (12th. June 1991)

Dipl.Ing L. Smrcek and Professor V. Broz gave an interview on Radio Free Europe during Professor Broz's visit to Glasgow which was subsequently broadcast, again in June 1991, within Czechoslovakia.

1.2.5 Action 1 visits.

Action 1 Visits and Meetings are summarised below: -

May 1991 In transit for Glasgow (See 2.1., Action 2 Training/Study Assignments, page 5.), Professor V. Broz and Ing. F. Vitek visited Delft for discussion on the Action 2 mobility flows. Dipl.Ing L. Smrcek joined them in Delft during his visit there on EC Erasmus business

June 1991 CVUT representatives Ing. L. Janko, Ing. S. Slavik and Ing. L. Smrcek (JEP Design Coordinator) visited the Paris Air show.

Aug. 1991 Mr. R. Fletcher, Glasgow based Tempus JEP Administrator, visited Prague and Moravia to review student projects (see below, 2.1 Action 2. Training/Study Assignments) and generally to meet principals of the participating Institutions and manufacturing organisations. Discussions with Professor V. Broz considered Mobility flows for 1991/92, banking arrangements at Zivnostenska Banka, Prague (See above, 1. 1), the provision of laboratory space and services at CVUT for forthcoming installation of hardware and experimental facilities, and the form and content of the Final Report for the TEMPUS Office.

1.2.6 Activities planned for 1992/93.

The activities anticipated in the academic year 1992/93 remain unchanged from the interim report submitted to the TEMPUS Office in April 1991.

A JEP "Newsletter" is planned. This will be circulated approximately quarterly to all the participating organisations and Institutions.

1.3 Links with EC Funded Networks.

The JEP has no formal links with EC funded networks. However, the Department of Aerospace Engineering at Glasgow University participates in the EC ERASMUS programme which is also coordinated by Dipl.Ing Smrcek . There can be no doubt that the ERASMUS and TEMPUS participations are collectively beneficial to the Institutions participating in both programmes - if only because administrative procedures for setting up student visits can be applied to both programmes.

1.4 Difficulties.

There have been no major changes in the activities or long term objectives outlined in the original proposal. However, in pursuing the JEP objectives, difficulties were encountered which arose from the mismatch between the TEMPUS grant "year" (December 1990 to September 30th 1991) and the academic year worked by the EC and Czech educational institutions. Proposed visits could not be planned until the contracting institutions and the grant coordinators were confident that funding was in place. By this time, students in Czechoslovakia had largely committed themselves to study programmes in their own university (CVUT) leading to their final degree. Visit starts were thus inevitably delayed until September 1991. This was after consultation with the TEMPUS Office in Brussels. The consequence of these late starts, in terms of the budgeting of Mobility Grants for 1990-91 and 1991-92 will be referred to later in this report. This particular difficulty should not arise again, since the second year of funding was allocated in July 1991. But the second budget period (October 1st 1991 to August 30th 1992) will only exacerbate the administrative and budgeting difficulties for students travelling on placements or study assignments during the long summer vacation common to most European universities and polytechnics.

The coordinators in Glasgow believe (and their view is shared by counterparts in Czechoslovakia) that a TEMPUS accounting year running for 11 or 12 months from the beginning of **June** would better match the participating Universities' academic year. This would allow visit programmes to be established in good time for the forthcoming university year and, equally important, would allow the participating Czech institutions to plan their students programmes in EC locations (and vice-versa) so that visits could always be completed within a single TEMPUS accounting year. For example - full session visit from October to June, 3/4/5 month visits from October , January or March, summer vacation visits or placements from July to the start of term in late September or October.

That part of the project involving the cooperative design of light aircraft started well, but as the JEP expanded and more effort heads to be put into other aspects, progress with the aircraft design aspects has been somewhat slowed. The original proposal to design, build and test three light aircraft during the three years of the JEP now seems over ambitious, and it is clear that to fulfil this programme whilst satisfying the expectations of all the participating Universities will require that the programme be extended beyond the three years originally envisaged.

2. Action 2 Activities.

Note **All reports subsequent upon the Mobility 2 visits and assignments noted here are collated in Appendix 1 to this report.**

2.1 Action 2 Training/Study Assignments

May/June 1991 Professor V.Broz and Dipl. Ing. F. Vitek, from CVUT, Prague, visited the Department on a staff assignment of five weeks. They familiarised themselves with the structure of Engineering undergraduate courses in the Faculty of Engineering of Glasgow University and in particular with such courses in the Department. They participated in the examining process in the Department during the May/June diet of undergraduate examinations. They attended lectures in connection with the Department's in-flight experiments course for 3rd. year students. Both visitors were introduced to the range of teaching methods used in the Department, in lecturing , laboratory work and project work. Dipl.Ing Vitek in particular gained significant experience with the Department's computing hardware and software, and, with Dr.Frank Coton, one of the JEP coordinators, finalised the detailed orders for hardware to be purchased on behalf of CVUT Prague from the Action 1 equipment allocation. Professor Broz and Dipl.Ing Vitek also made contact with locally based aircraft manufacturers British Aerospace and visited aerospace engineering departments at Cranfield College of Aeronautics.

July 1991 Four Glasgow students visited Czechoslovakia on practical study assignments for 3 months. Two students were based in Prague to carry out projects at VZLU, Prague, and two in Moravia at Aerotechnik, Uherske-Hradiste, also did project work.

July 1991 Dr. M.Vezza, from Glasgow, visited Prague to consult with counterparts in CVUT about U.K. students' practical assignments, and to supervise the early stages of two such assignments based in Prague.

July 1991 Dipl.Ing L. Smrcek visited locations in Czechoslovakia for discussion with Moravan, LET, Aerotechnik, VZLU and CVUT on forthcoming student visits, and to review the arrangements made for staff and students visits between Czechoslovakia and EC locations, (See 2.1., Action 2 Training/Study Assignments, page 5). He acted as external examiner for the Department of Aeronautics at CVUT. He also met academic staff from Zilina High School of Transport in Slovakia to discuss the possibility of the School joining the JEP in its third year.

Sept.1991 Ing. S.Slavik from the Department of Aeronautics, CVUT visited the Department for 5 weeks on a training assignment.

Ing. L. Janko from the Department of Aeronautics, CVUT visited the Polytechnic University of Turin for a study assignment of 5 weeks.

Ing. D. Hanus from the Department of Aeronautics, CVUT visited Toulouse for a training assignment of 5 weeks.

Prof.Ing. K.Filakovsky and Ing. V.Danek of Department of Aeronautics, CVUT visited Faculty of Air and Space Technology, University of Stuttgart, each for a period of 2 weeks.

Mr. Michal Urban, 4th year student from CVUT began a study visit of 9 months during which he will attend all classes of the Glasgow Final Year Honours curriculum in Aerospace Engineering including a project.

Mr. Thomas Heczko, 5th. year student from CVUT began a practical placement of 9 months at ZLIN Electronics,(Avionics manufacturer), Cheltenham, UK where he will carry out a project based in electronic circuit design using CAD/CAM techniques.

Mr. Pavel Zacek, 4th. year student from CVUT began a study period of 5 months in the Polytechnic of Turin.

Mr. Radomir Prchal, 5th. year student from CVUT, began a study period of 5 months in Toulouse, France.

Mr. Petr Jirutka, 5th. year student from CVUT, began a study period of 5 months in Stuttgart, Germany.

Mr. Pavel Rausa, 4th. year student from CVUT, began a study period of 5 months in Madrid, Spain.

2.2 Administrative Procedures

i) Staff Visits, (Czechoslovakia to Glasgow) completed BEFORE bank account available in Prague.

CVUT staff members paid their own travel expenses in advance in Czechoslovakia and reclaimed these from TEMPUS funds after their arrival in the U.K Accommodation , which was in University self-catering post-graduate flats, was paid against invoices supplied to the Tempus administrator from Tempus funds. Subsistence allowances (in GBP) were paid approximately fortnightly by the Tempus administrator by cash from Tempus funds. In all cases, Tempus funds held in Glasgow were used.

ii) Subsequent Staff Visits to all EC Locations. (from July 1991)

In all cases, Professor V. Broz drew funds in the appropriate national currency sufficient for each visit as specified in the contract. Recipients signed receipts for their grants and these were duly forwarded to the Administrator in Glasgow. At the same time, Zivnostenska Banka in Prague suppled records of the individual transactions carried out b y Professor Broz. In due course, the individual staff members will supply tick to the Glasgow administrator via Professor V. Broz at CVUT. Cooperation in these matters has been excellent

iii) Student Visits, Czechoslovakia to all EC Institutions (inc.U.K)

as 2) Staff Visits.

iv) Student Visits, U.K. to Czechoslovakia.

Travel expenses and funds to cover accommodation/subsistence expenses were paid in cash in advance of the visit from Tempus funds in Glasgow. Receipts signed by the students were required and these are retained for accounting purposes in Glasgow. (Special circumstances arose in connection with the four visits from Glasgow to Czechoslovakia. Two students based in Moravia had accommodation provided free by LET, and one student was able to travel on a free "duty" ticket supplied by British Airways.) On their return to the U.K. the Prague-based students supplied the Hall of Residence receipts to the Administrator.

CVUT in Prague selected students to receive Mobility Grants on the basis of academic excellence and language ability. UK students were allocated visits to Czechoslovakia on a first come first served basis, but on condition that they satisfied the entrance requirements for the Final Year Honours B.Eng. course in Aerospace Engineering at Glasgow before making the visit. All four students in fact did so. All four students completed a three week course in Czech, at Glasgow University, before their visits. This also was a condition of their going.

No staff replacement costs were incurred as a result of staff visits made during the budget year.

To repay institutional costs for EC locations, the Glasgow administrator invited eligible institutions to submit a claim with confirmatory details of the student visit. On receipt of these details, payment was made from Tempus funds in Glasgow.

2.3 Problems

There have been no significant problems in administering the grants, but attention is drawn to the comments made earlier in the report about the mismatch between the Tempus budget year and the academic year worked by EC and Czech institutions. (See 1.4., Difficulties, page 4).

The date of first award of grant (December 1990) caused difficulties in planning the programme of student study visits. This has been referred to earlier. It should not be a recurring problem, now that the administrative structures are firmly in place and personnel in the participating Institutions are becoming familiar with each others working patterns.

2.4 Recommendations.

Mobility planning would be greatly facilitated for JEPs of longer duration that one academic session, by an TEMPUS accounting year extending from May/June to May/June of the following year. This would give maximum flexibility in the timing and duration of visits without the administrative difficulty of transferring partial mobility grants from one budget year to the next. (See notes attaching to the statement of expenditure.)

2.5 Grantholders' Summary Reports.

Copies of these are attached, Appendix 1

Note that there are as yet no reports relating to the student visits from Czechoslovakia to EC locations which began in September 1991. The students had been in their assigned places for only two weeks by the end of the first JEP year, (and see 1.4., above, Difficulties). In these circumstances, the coordinators felt that a report from them would be unnecessary. They will, of course, submit reports to Glasgow at the end of their study periods